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Remarks

The Applicants have amended claims 1, 7, 17, 21 and 27 for clarity. Claims 8, 18 and 28 have been rewritten as independent claims to put them in a form that the Examiner deemed allowable. The Applicants have also added claims 51-56 which are more specifically directed to one intended application of the claimed invention.

The Examiner rejected claims 1-7, 9-17, 19-27, 29-30 and 45-50 under 35 USC 103(a) as being unpatentable over Stone (US 6,041,057) in view of Schwartz et al (US 6,185,214).

Stone discloses VLANs interconnected across an ATM network using ATM tag switching. Because the ATM network is connection-oriented, Stone defines a protocol whereby edge switches of the ATM network initiate tagged point-to-point and point-to-multipoint virtual connections for forwarding end-user messages between VLAN segments across the ATM network (column 2, line 38 to column 3, line 43).

The ATM switches forward the end-user messages by associating VLAN identifiers in the end-user messages with tag values of the established tagged virtual connections. The tag values are used to route the end-user messages link by link via the tagged virtual connections. At each successive switch in the tagged virtual connections, the tag values are translated into tag values for a next link of the virtual connection until the end-user messages reach destination edge switches of the ATM network (column 2, line 44 to column 3, line 10).

VLAN packets comprising the end-user messages are segmented into fixed length ATM cells at the edge switch where they enter the ATM network (column 12, lines 49-51), and must be reconstructed at the edge switch where they leave the ATM network.

In the Applicants' claims, an "egress address" is assigned to each packet entering the network via an ingress virtual port. The egress address corresponds to a respective destination address of the entering packet when a correspondence between the destination address and an egress address is known. The egress address is a broadcast egress address corresponding to a unique set of virtual ports

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to which the ingress virtual ports belongs when no correspondence between the destination address and an egress address is known. The assigned egress address is added to the packet, and the packet is routed across the network according to the egress address to the egress virtual port where the egress address is removed from the packet.

The Examiner argued that Stone discloses assignment of an "egress address" in the Abstract at lines 7-8 and in column 7 at lines 31-40. The cited lines of the Abstract disclose establishment of point-to-multipoint tagged virtual connections, and the cited lines of column 7 disclose assignment of "tag values" to end-user messages. The Examiner argued that Stone discloses addition of an "egress address" to a "packet" entering a network at column 7 lines 31-34 and lines 45-48, and routing of "modified messages" according to the "egress addresses" at column 8, lines 37-45. The cited lines of column 7 disclose assignment of "tag values" to end-user messages and forwarding of the messages along established tagged point-to-point and point-to-multipoint tagged virtual connections. The cited lines of column 8 also disclose assignment of "tag values" to end-user messages and forwarding of the messages along established tagged point-to-point tagged virtual connections and further disclose a transit switch receiving a tagged end-user message and translating the received tag value into an "outbound tag value" and forwarding the end-user message.

The Examiner appears to identify the "tag values" of Stone with the "egress addresses" of the Applicants' claims. However, the ATM tags of Stone differ from the "egress addresses" of the Applicants' claims because the tags simply provide the routing to the next switch in the ATM network and are changed at each transit switch — i.e. the ATM tags of Stone do not point to the egress point of the network at which the packet leaves the network and are not "egress addresses". The Applicants' "egress addresses" can be used to route packets at multiple nodes across the network without translation because they identify one or more egress ports of the network. Consequently, the Applicants' claimed approach is very different in practical terms from the Stone's disclosure because Stone requires a significantly more processing at transit nodes to carry a packet across the ATM network than does the Applicants' claimed invention to carry the packet across Applicants' network.

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In fact, Stone requires even more extra processing because he first sets up ATM virtual connections, including backup virtual connections, and Stone has to manage those connections. By using egress addresses to route packets instead of ATM virtual circuits to route cells, the Applicants avoid the significant overhead of setting up and managing virtual circuits.

Moreover, Stone incurs further processing overhead by breaking incoming LAN frames into ATM cells of standard length (column 12, lines 49-51), and by therefore needing to reconstruct the LAN frames at the egress nodes where the end-user messages are transferred to other VLAN segments.

The Applicants have added language to independent claims 1, 7, 17, 21 and 27 to state even more clearly that the egress address assigned at the ingress virtual port where the packet enters the network remains with the packet for routing along the entire path across the network to one or more egress virtual ports of the network. Claim 11 already contained the limitation "such that packets can be routed by plural successive routing devices according to egress addresses assigned where the packets enter the network".

The Examiner cites Schwartz et al to show "a mapping between physical ports and virtual ports". However, Schwartz does not address the deficiencies of Stone with regard to the Applicants' claims as discussed above.

In particular, Schwartz does not disclose the assignment of a true "egress address" to packet entering a network and the use of the assigned "egress address" to route the packet across the network to an egress virtual port. Instead, Schwartz uses the VLAN ID to determine output port(s) at each switch using VLAN forwarding table shown in Fig 15. As noted at page 2, lines 1-11 of the Applicants' specification, Schwartz's use of the VLAN ID instead of an assigned egress address limits the number of distinct VLANs that can be supported to value that is simply inadequate for Service Provider networks. Moreover, as noted in previous responses, different customers of a Service Provider may use the same VLAN IDs, so that use of the VLAN ID to route packets in a Service Provider would provide unacceptable breaches of security with private data from one customer being communicated to another customer.

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With regard to claims 6, 16, 26, the Examiner argued that Stone discloses assignment of an "ingress address" and population of an address association table at column 7, lines 12-15, and use of the address association table to determine a correspondence between a destination address and an egress address at column 13, lines 1-6 and column 14, lines 13-19. Applicants' claims 6, 16 and 26 require that the ingress address assigned to a packet correspond to the virtual port via which the packet entered the network. Column 7, lines 12-15 describe association of a tag value with a source switch identifier. Neither the tag value nor the source switch identifier is an "ingress address", and neither corresponds to the virtual port on which the corresponding packet entered the network. (Subsequent lines of column 7 disclose learning of a "source station address". This is an address on the LAN and not an address of a virtual port on the network, so the "source station address is also not an "ingress address" as defined by claims 6, 16 and 26.) Column 13, lines 1-6 refer to message encoding on the LAN segment, not in the ATM network and are therefore not relevant to claims 6, 16 and 26. Column 14, lines 13-19 describes processing of packets routed across the ATM network at a destination edge switch of the ATM network. This processing does not employ the associations stored in databases using processes described in column 7 and does not use "egress addresses" corresponding to virtual ports of the ATM network. In conclusion, none of these sections of Stone's disclosure relate to "ingress addresses" and "egress addresses" that meet the requirements of Applicants' claims 6, 16 and 26, and these sections of Stone's disclosure are not logically connected in the manner suggested by the Examiner so as to assemble elements of the Applicants' claims.

In summary, neither Stone nor Schwartz shows assignment of an "egress address" at ingress node and use of the assigned "egress address" to route packets across a network to an egress virtual port as claimed. Consequently, no combination of these references can show this feature. The Applicants therefore maintain that claims 1-7, 9-17, 19-27, 29-30 and 45-50 are patentable over Stone (US 6,041,057) and Schwartz et al (US 6,185,214), and request reconsideration and withdrawal of the rejection under 35 USC 103(a).

The Applicants acknowledge with thanks the allowance of claims 32-44.

The Examiner objected to claims 8, 18, 28 and 31 as being dependent on rejected base claims, but indicated that these claims would be allowable if rewritten in independent form. The Applicants have rewritten claims 8, 18 and 28 to expedite

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allowance of these claims. Claim 31 is dependent on rewritten claim 28. The Applicants request allowance of these claims.

The Applicants have also added claims 51-56 which are more specifically directed to one intended application of the claimed invention. The Applicants submit that these claims are fairly based on the embodiment described in the specification, and are patentable over the references of record for the reasons stated above and in responses to previous office actions.

In view of the above discussion, the Applicants request reconsideration and allowance of the amended application.

A fee calculation sheet and well as a fee transmittal in enclosed herewith. Should additional fees be necessary in connection with the filing of this paper, or if a Petition for Extension of Time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account #14-1315 for any such fees; and Applicants hereby petition for any needed extension of time.

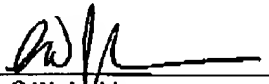
Yours very truly,

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